UNITED STATES PATENT AND TRADEMARK OFFICE

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/880,404	06/12/2001	Akila Sadhasivan	42390P10595	7126

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EXAMINER
ELMORE, REBA I

ART UNIT	PAPER NUMBER
2187	8

DATE MAILED: 02/26/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

PTO-90C (Rev. 10/03)

	Application No.		Applicant(s)	
Office Action Summary	09/880,404		SADHASIVAN ET AL.	
	Examiner		Art Unit	
	Reba I. Elmore		2187	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE <u>3</u> MONTH(S) FROM
THE MAILING DATE OF THIS COMMUNICATION.
- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed
  after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
  Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any
  earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on <u>28 November 2003</u>.

2a)☒ This action is **FINAL**.   2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is
closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-14,19-21 and 25-29* is/are pending in the application.

    4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-14,19-21 and 25-29* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☒ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☒ objected to by the Examiner.

    Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

    Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

    a)☐ All b)☐ Some * c)☐ None of:

    1.☐ Certified copies of the priority documents have been received.

    2.☐ Certified copies of the priority documents have been received in Application No. _____.

    3.☐ Copies of the certified copies of the priority documents have been received in this National Stage
        application from the International Bureau (PCT Rule 17.2(a)).

    * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1)☒ Notice of References Cited (PTO-892)
2)☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3)☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
    Paper No(s)/Mail Date _____.

4)☐ Interview Summary (PTO-413)
    Paper No(s)/Mail Date. _____ .
5)☐ Notice of Informal Patent Application (PTO-152)
6)☐ Other: _____.

DETAILED ACTION

1.   Claims 1-14, 19-21 and 25-29 are presented for examination.

Drawings

2.   The drawings are objected to for the following informalities:

the brief description of the drawings should state whether or not the figure depicts an

embodiment of the present invention or a conventional aspect of the prior art. This objection is

given for both the drawings and the disclosure as either the figures can be labeled 'Prior Art' to

overcome this objection or the specification can be clarified in the description of the drawings on

page 5 to state the figure is an embodiment of the present invention.

Specification

3.   The disclosure is objected to because of the following informalities: the disclosure should

contain a section titled 'Brief Summary of the Invention' placed after the background of the

invention and before the description of the drawings. The following is given to provide further

guidelines for this requirement.

Content of Specification

(a)   Title of the Invention: See 37 CFR 1.72(a) and MPEP § 606. The title of the
       invention should be placed at the top of the first page of the specification unless
       the title is provided in an application data sheet. The title of the invention should
       be brief but technically accurate and descriptive, preferably from two to seven
       words may not contain more than 500 characters.

(b)   Cross-References to Related Applications: See 37 CFR 1.78 and MPEP § 201.11.

(c)   Statement Regarding Federally Sponsored Research and Development: See MPEP
       § 310.

(d)   Incorporation-By-Reference Of Material Submitted On a Compact Disc: The
       specification is required to include an incorporation-by-reference of electronic
       documents that are to become part of the permanent United States Patent and

Trademark Office records in the file of a patent application. See 37 CFR 1.52(e) and MPEP § 608.05. Computer program listings (37 CFR 1.96(c)), "Sequence Listings" (37 CFR 1.821(c)), and tables having more than 50 pages of text were permitted as electronic documents on compact discs beginning on September 8, 2000.

Or alternatively, Reference to a "Microfiche Appendix": See MPEP § 608.05(a). "Microfiche Appendices" were accepted by the Office until March 1, 2001.

(e)   Background of the Invention: See MPEP § 608.01(c). The specification should set forth the Background of the Invention in two parts:

  (1)   Field of the Invention: A statement of the field of art to which the invention pertains. This statement may include a paraphrasing of the applicable U.S. patent classification definitions of the subject matter of the claimed invention. This item may also be titled "Technical Field."

  (2)   Description of the Related Art including information disclosed under 37 CFR 1.97 and 37 CFR 1.98: A description of the related art known to the applicant and including, if applicable, references to specific related art and problems involved in the prior art which are solved by the applicant's invention. This item may also be titled "Background Art."

(f)   Brief Summary of the Invention: See MPEP § 608.01(d). A brief summary or general statement of the invention as set forth in 37 CFR 1.73. The summary is separate and distinct from the abstract and is directed toward the invention rather than the disclosure as a whole. The summary may point out the advantages of the invention or how it solves problems previously existent in the prior art (and preferably indicated in the Background of the Invention). In chemical cases it should point out in general terms the utility of the invention. If possible, the nature and gist of the invention or the inventive concept should be set forth. Objects of the invention should be treated briefly and only to the extent that they contribute to an understanding of the invention.

(g)   Brief Description of the Several Views of the Drawing(s): See MPEP § 608.01(f). A reference to and brief description of the drawing(s) as set forth in 37 CFR 1.74.

(h)   Detailed Description of the Invention: See MPEP § 608.01(g). A description of the preferred embodiment(s) of the invention as required in 37 CFR 1.71. The description should be as short and specific as is necessary to describe the invention adequately and accurately. Where elements or groups of elements, compounds, and processes, which are conventional and generally widely known in the field of the invention described and their exact nature or type is not necessary for an understanding and use of the invention by a person skilled in the art, they should not be described in detail. However, where particularly

complicated subject matter is involved or where the elements, compounds, or processes may not be commonly or widely known in the field, the specification should refer to another patent or readily available publication which adequately describes the subject matter.

(i)   Claim or Claims: See 37 CFR 1.75 and MPEP § 608.01(m). The claim or claims must commence on separate sheet or electronic page (37 CFR 1.52(b)(3)). Where a claim sets forth a plurality of elements or steps, each element or step of the claim should be separated by a line indentation. There may be plural indentations to further segregate subcombinations or related steps. See 37 CFR 1.75 and MPEP § 608.01(i)-(p).

(j)   Abstract of the Disclosure: See MPEP § 608.01(f). A brief narrative of the disclosure as a whole in a single paragraph of 150 words or less commencing on a separate sheet following the claims. In an international application which has entered the national stage (37 CFR 1.491(b)), the applicant need not submit an abstract commencing on a separate sheet if an abstract was published with the international application under PCT Article 21. The abstract that appears on the cover page of the pamphlet published by the International Bureau (IB) of the World Intellectual Property Organization (WIPO) is the abstract that will be used by the USPTO. See MPEP § 1893.03(e).

(k)   Sequence Listing, See 37 CFR 1.821-1.825 and MPEP §§ 2421-2431. The requirement for a sequence listing applies to all sequences disclosed in a given application, whether the sequences are claimed or not. See MPEP § 2421.02.

Appropriate correction is required.

4.   The disclosure is objected to because the brief description of the drawings should state whether or not the figure depicts an embodiment of the present invention or a conventional aspect of the prior art. This objection is given for both the drawings and the disclosure as either the figures can be labeled 'Prior Art' to overcome this objection or the specification can be clarified in the description of the drawings on page 5 to state the figure is an embodiment of the present invention.

5.   The specification has not been checked to the extent necessary to determine the presence

of all possible minor errors. Applicant's cooperation is requested in correcting any errors of

which applicant may become aware in the specification.

Claim Objections

6.   The objection to claim 8 is *withdrawn* due to the amendment.

35 USC § 102

7.   The rejection of claims 1-3, 5-7 and 11-14 as being anticipated by Hazen et al. is

withdrawn due to the amendment.

8.   The rejection of claims 19-21 as being anticipated by Brown et al. is *maintained* but

updated to include changes made by the amendment.

9.   The rejection of claims 8-10 and 25-28 as being anticipated by Hansen et al. is

withdrawn due to the amendment.

10.   The following 102(e) rejections are now given.

11.   The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the

basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (e) the invention was described in a patent granted on an application for patent by another filed in the United States before the invention thereof by the applicant for patent, or on an international application by another who has fulfilled the requirements of paragraphs (1), (2), and (4) of section 371(c) of this title before the invention thereof by the applicant for patent.

12.   Claims 8 and 19-21 are rejected under 35 U.S.C. 102(e) as being anticipated by Hazen et

al. (P/N 6,088,264)

13.   Hazen teaches the invention (claim 8) as claimed including an apparatus comprising:

a means for partitioning a memory device to a first plurality of partitions storing code and

as second plurality of partitions for storing data to enable multiple operations to be performed on

the memory device at the same time (e.g., see (e.g., see Figure 3 and col. 3, lines 38-59); and

a means for setting each of the partitions to a status mode to track operations performed

on the memory device as each of the partitions having a status register along with related

circuitry (e.g., see col. 3, line 60 to col. 4, line 15).

14.   Claims 19-21 are rejected under 35 U.S.C. 102(e) as being anticipated Brown et al. (P/N

6,201,739 B1)

15.   Brown teaches the invention (claim 19) as claimed including an apparatus comprising:

a memory device having a code partition and a data partition, wherein the code partition

comprises a low level function that is performed on data stored in the data partition as the

functionality of suspending erase operations on any block in the memory device including the

blocks comprising the data partition (e.g., see col. 5, lines 46-67); and,

a flag to indicate when a suspend operation has occurred (e.g., see Figures 10-11).

As to claim 20, Brown inherently teaches a low level function for determining that a

suspend operation has occurred if a requested second task of the data partition has a higher

priority than a first task of the data partition as this must take place for the proper execution of

code accessing data in order to provide correct results of the program code being executed.

As to claim 21, Brown teaches the memory device is a flash memory (e.g., see col. 5,

lines 22-35).

35 USC § 103

16.   The rejection of claim 4 as being unpatentable over Hazen et al. in view of Lee is

withdrawn due to the amendment.

17.   The following 103 rejections are now given.

18.   The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all

obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

19.   Claims 1-7, 9-14 and 25-29 rejected under 35 U.S.C. 103(a) as being unpatentable over

Hazen et al. (P/N 6,088,264) in view of Brown et al. (P/N 6,201,739 B1).

20.   Hazen teaches the invention (claim 1) as claimed including a method of performing

multiple operations on a memory device, the method comprising:

dividing the memory device into k partitions, wherein k is an integer greater than or equal

to two as partitioning a flash memory into partitions (e.g., see Figures 2-3 and col. 3, lines 29-

59);

performing code operations from m code partitions out of k total partitions, wherein m is

an integer greater than or equal to one as the memory device being partitioned such that a first

partition is used to store data while a different second partition stores code and a third partition is

used for updating the code (e.g., see col. 3, lines 44-59); and,

performing data operations from n data partitions out of k total partitions through low

level functions accessed from the code partitions at approximately the same time as the code

operations are performed form the m code partitions wherein n is an integer greater than or equal

to one as having the ability to either update the code utilizing a third partition while the original code in the second partition is concurrently executing as well the condition of executing code from a first partition while updating data in a second partition (e.g., see col. 3, lines 44-59).

Hazen does not specifically teach the method step of suspending the data operations of the n data partitions if a preempting operation is detected, however Brown teaches using a preempt pin to suspend operations in a flash memory device. It would have been obvious to one of ordinary skill in the art at the time the invention was made to use the preempt pin arrangement with the partitioned flash memory device as taught by Hazen because the suspension of a command allows greater flexibility and longevity for flash memory devices by utilizing a more sophisticated control structure rather than always erasing and writing to a flash memory device which has a limited number of times for being written to and erased. By incorporating a preempt or suspend operation with the flash memory code fetching data from the data partition operations is also preempted or suspended under certain conditions because the code must use data from the data partition for the operation. The command decoder and command latches decode read and read status to the data partition and therefore allow these commands to be preempted or suspended similarly to the preemption or suspension of the execution of code held in the code partition.

As to claim 2, Hazen teaches the data partition and the code partitions do not overlap each other in the memory device (e.g., see Figures 2-3 and col. 3, lines 16-23).

As to claim 3, Hazen teaches the m code partitions and the n data partitions equal the k total partitions as there being three total partitions with one data partition and two code partitions (e.g., see Figures 2-3 and col. 3, lines 38-59).

As to claim 4, Hazen teaches each of the m code partitions are equal in size to each of the n data partitions as one of the possibilities for the multi-partitioned flash memory device, i.e. the partitions can be either the same size or different sizes (e.g., see col. 2, lines 23-43).

As to claim 5, Hazen teaches the m code partitions and the n data partitions are fixed in memory space (e.g., see col. 2, lines 23-43).

As to claim 6, Hazen teaches the memory device is a flash memory (e.g., see col. 2, lines 23-43).

As to claim 7, Hazen teaches the flash memory is a flash electrically erasable read only memory (EEPROM) array (e.g., see col. 1, lines 9-18).

As to claims 9 and 10, Hazen does not specifically teach a means for saving a preempted operation before entering an interrupt routine and then restoring a preempted operation following an interrupt routine, however, Brown teaches both erase suspend circuitry and program suspend circuitry with latches to maintain the operations in order to resume either the erase function or the program function which was suspended (e.g., see Figure 9 and col. 7, line 19 to col. 8, line 25)). It would have been obvious to one of ordinary skill in the art at the time the invention was made to combine the teachings of Brown with the teachings of Hazen because this functionally allows the completion of the operation without requiring extensive resetting or restarting of the program or activity and thereby allows for a more concise and accurate operation of the device.

21.   Hazen teaches the invention (claim 11) as claimed including a memory array comprising:

a data partition (e.g., see Figures 2-3 and col. 3, lines 38-59);

a code partition (e.g., see Figures 2-3 and col. 3, lines 38-59);

a status mode to provide a partition status from the memory array if a task request is

received by the data partition (e.g., see col. 2, lines 60-64 of Hazen), wherein if the partition

status is busy, an algorithm in the code partition determines whether the task request preempts an

existing task is better taught by the secondary reference, Brown et al. Brown also uses status

registers for each partition (e.g., see col. 6, line 47 to col. 7, line 18) and it is inherent that an

algorithm exist for a task being preempted as this is a normal program activity for when a

conflict for using the same memory location is executed, for instance, in order to maintain data

coherency there are times writes must take place before a read to a memory location for vice

versa – this is typical of any memory device. It would have been obvious to one of ordinary skill

in the art at the time the invention was made to combine the teachings of Brown with the

teachings of Hazen as Brown is providing details and more complete circuitry for a function

which Hazen must also implement as every memory device must maintain coherency with the

other memory within the system as well as with the execution sequence of the algorithms or code

being executed; and,

a read mode to enable code and data to be read from the memory array (e.g., see col. 2,

lines 16-22); and;

a write mode to enable data to be written to the memory array (e.g., see col. 2, lines 16-

22).

As to claim 12, Hazen teaches the code is programmed into the memory array (e.g., see

col. 3, lines 38-59).

As to claim 13, Hazen teaches the write mode enables erase operations to be performed

on data stored in the memory array (e.g., see col. 2, line 65 to col. 3, line 19).

As to claim 14, Hazen teaches the memory array is a flash memory array (e.g., see (e.g., see col. 1, lines 9-18).

22.	Hazen teaches the invention (claim 25) as claimed including a method comprising:

running a first operation of a first partition of a memory array as executing an operation (e.g., see col. 3, lines 38-59);

running a first operation of a second partition of the memory array as the ability to access each partition independently (e.g., see col. 3, lines 38-59); and,

Hazen does not specifically teach determining from the first operation of the first partition if the second operation of the second partition has a higher priority than the first operation of the second partition, however, Brown teaches being able to suspend operations depends upon which operations being executed which inherently requires determining the priority of execution of the code (e.g., see Figures 11-14). It would have been obvious to one of ordinary skill in the art at the time the invention was made to combine the teachings of Brown with the teachings of Hazen because this functionally allows the completion of the operation without requiring extensive resetting or restarting of the program or activity and thereby allows for a more concise and accurate operation of the device.

As to claim 26, Brown teaches suspending the first operation of the second partition if the second operation has a higher priority than the first operation as Brown being suspend operations depend upon which operations being executed which requires determining the priority of execution of the code (e.g., see Figures 11-14).

As to claim 27, Brown teaches setting a flag to indicate that the first operation of the second partition must resume after the second operation is completed (e.g., see Figures 11-14).

As to claim 28, Brown inherently teaches running the second operation of the second partition.

As to claim 29, Brown teaches ignoring the request to perform the second operation of the second partition if the first operation has a higher priority than the second operation as the ability to suspend operations as necessary (e.g., see Figures 11-14).

Response to Applicant's Remarks

23.   Applicant's arguments with respect to claims 1-14, 19-21 and 25-29 have been considered but are moot in view of the new ground(s) of rejection.

Action is made Final

24.   Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.
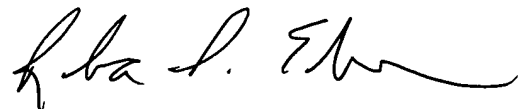
Conclusion

25.   The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

26.   Any inquiry concerning this communication or earlier communications from the examiner should be directed to Reba I. Elmore, whose telephone number is (703) 305-9706. The examiner can normally be reached on M-TH from 7:30am to 6:00pm, EST.

If attempts to reach the examiner by telephone are unsuccessful, the art unit supervisor for AU 2187, Donald Sparks, can be reached for general questions concerning this application at (703) 308-1756. Additionally, the official fax phone number for the art unit is (703) 746-7239.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the Tech Center receptionist whose telephone number is (703) 305-3800/4700.

Reba I. Elmore
Primary Patent Examiner
Art Unit 2187